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(54) Title of the Invention: **Oral cleaning implement**

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SPECIFICATION

1. Title of the Invention

Oral cleaning implement

2. Claims

(1) Oral cleaning implement employing as bristles filaments composed of an engineering elastomer.

(2) Oral cleaning implement according to claim 1 wherein said oral cleaning implement is a dental brush having bristles implanted in a bristle section, bristles composed of engineering elastomer being implanted at a minimum in the outer portion of the bristle section.

(3) Oral cleaning implement according to claim 2 wherein said dental brush has bristles composed of engineering elastomer implanted in the outer portion of the bristle section, and bristles composed of engineering plastic such as nylon filament etc. in the inner portion of the bristle section.

(4) Oral cleaning implement according to claim 1 wherein said oral cleaning implement is a polishing implement exclusively having bristles composed of engineering elastomer implanted in the distal end face of rod-like handle, [said bristles] being implanted along the lengthwise axis of said handle.

(5) Oral cleaning implement according to claim 1 wherein said oral cleaning implement is an interdental brush, said bristles being composed entirely of filaments of engineering elastomer.

(6) Oral cleaning implement according to any of claims 1 to 5 wherein said engineering elastomer is a polyester based thermoplastic elastomer.

(7) Oral cleaning implement according to any of claims 1 to 5 wherein said engineering elastomer is a polystyrene based thermoplastic elastomer.

3. Detailed Description of the Invention

(Field of Industrial Utilization)

The present invention relates to an oral cleaning implement.

(Prior Art)

The dental brush is the most commonly used oral cleaning implement, and a wide variety of designs have been proposed. Among these is the so-called "double bristle type" dental brush having rigid bristle implanted in the inner portion of the bristle section and soft bristle implanted in the outer portion. The rigid inner bristles maintain cleaning action, while the soft outer bristles are designed to provide massaging action.

Known oral cleaning implements designed to provide massaging action include that depicted in Figs. 5 and 6, comprising rubber plates 12 (or sponge plates) adhered in the outer portion the bristle section 11 bristles 13 are implanted in the inner portion; and one having rubber portions (or sponge portions) and bristles in a random arrangement. In the drawings, 14 denotes a handle and 15 denotes a through hole.

(Problem the Invention Attempts to Solve)

However in a dental brush of the double bristle type described above, the same type of plastic serves as the material for [all of] the bristles, differences in rigidity/softness being produced through differences in bristle diameter, resulting in the problem of poor durability of the rigid outer bristles. Oral cleaning implements employing rubber plates (or sponge plates) have the drawback that the inner bristle section is not fully cleaned by, for example, rinsing with water, possibly resulting in an unhygienic condition; and of poor oral clearing action by the outer portion, since it is not composed of bristles. Implements having sponge plates tend to collect food residues, and since these do not dry out easily, there is a fair likelihood of an unhygieaic condition.

Conventional interdental brushes and polishing implements for oral cleaning employ bristles composed of nylon filament or other such engineering plastic filaments, and as such afford satisfactory cleaning action; however, there is the problem that the rigid bristles can easily injure gums and mucosa during brushing.

(Object of the Invention)

Accordingly it is an object of the present invention to provide an oral cleaning implement that solves the above problems by offering high cleaning/massaging action, posing no risk of injury to gums etc., and having excellent durability..

(Means for Solving the Problem)

The invention is an oral cleaning implement employing as bristles filaments composed of an engineering elastomer.

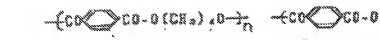
The engineering elastomer herein is a melt spinnable thermoplastic elastomer having qualities similar to engineering plastics, i.e. excellent strength, heat resistance, cold resistance, and chemical resistance, as well as elastomeric qualities.

Preferred engineering elastomers herein are:

(1) polyester based thermoplastic elastomers; and

(2) polystyrene based thermoplastic elastomers.

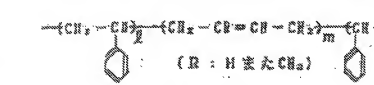
A specific example of (1) are resins whose molecular chain contains two segments, given by the structural formula:



(hard segment) (soft segment)

Such materials offer some of the best oil resistance, chemical resistance, age resistance and flexural fatigue resistance among the elastomers and soft plastics, and filaments composed of them are particularly suitable as bristles for a dental brush.

A specific example of (2) are resins given by the structural formula:



(R is H or CH_3)

Bristle filaments herein may also be produced by melt spinning of polymer blends containing other engineering elastomers.

Specific examples of oral cleaning implements herein using engineering elastomer bristles would include, in addition to an ordinary dental brush, an interdental brush, tongue brush (for cleaning the tongue) or dental floss. Implements are not limited to those having all bristles composed of elastomer bristles (see Fig. 1); those having some bristles composed of elastomer bristles are also possible.

As regards filament morphology, for dental brush of interdental brush applications monofilaments similar to those in conventional products may be used; however, for tongue brush or dental floss applications there is no limitation to monofilaments, it being possible to use multifilaments if so desired.

(Operation)

The oral cleaning implement of the invention employs a bristles filaments consisting of engineering elastomer, providing a soft feel against the gums etc., providing comfortable cleaning and massaging action.

(Examples)

The following description of the embodiments of the invention makes reference to the accompanying drawings. In the dental brush shown in Figs. 1 and 2 all of the bristles 2 of bristle section 1 are composed of engineering elastomer filaments (produced by melt spinning or spinning and drawing into fibers). Bristles 2 (more precisely, tufts) are implanted in the holes with staples. In the drawings 3 denotes a handle and 4 denotes a through hole.

The engineering elastomer bristles are highly resilient and have excellent flexural fatigue resistance, whereby the dental brush is soft, non-injurious to the gums and highly durable. Bristle morphology is no different from conventional dental brushes so there is no discomfort in use, and food residues are easily washed away making it hygienic.

Conventional devices and equipment for forming and implanting bristles can be used without modification, which has the advantage of not requiring additional special production equipment or modifications.

The article shown in Figs. 3 and 4 on the other hand is designed as a polishing implement having a bristle section 1 located on a distal end face of a handle 3, whose bristles 2 are entirely composed of engineering elastomer monofilaments and are arranged in bristle section 1 extending parallel to the longitudinal axis of handle 3. This polishing implement offers advantages similar to the dental brush shown in the Fig. 1 example.

By way of a modification to the Fig. 1 example herein, engineering elastomer bristles 2 may be implanted in the outer portion of bristle section 1 (i.e. outwardly in the direction perpendicular to the longitudinal axis of handle 3), while implanting in the inner

portion bristles 2; consisting of conventional material (nylon filaments, natural bristle etc.) (see Fig. 1); a dental brush having this arrangement will maintain good cleaning action by means of the inner bristles, while providing a soft feel to the gums and comfortable massaging action by means of the outer bristles.

As yet another embodiment, a dental brush or polishing implement may be produced by exclusively implanting tufts (i.e. a bundle of bristles corresponding to a single hole) composed of bundles of relatively rigid bristles, e.g. engineering elastomer filaments together with nylon filaments.

The invention also finds preferred embodiment as dental floss, which by stretching and contracting due to the resilience of the engineering elastomer provides advantages in cleaning either constricted areas between teeth or wider areas, with a single dental floss. By stretching the floss to constrict its diameter, inserting between teeth and then releasing, interdental cleaning action is markedly improved.

(Effects of the Invention)

According to the invention set forth herein there is provided a highly practical oral cleaning implement that, through the use as bristles of engineering elastomer filaments, provides good oral cleaning or massaging action, avoids injury to the gums, and is highly durable.

4. **Brief Description of the Drawings**

Fig. 1 is a plan view illustrating a dental brush embodiment of the invention; Fig. 2 is a front view thereof; Fig. 3 is a front view illustrating a polishing implement embodiment of the invention; Fig. 4 is a left side view thereof; Fig. 5 is a plan view of a conventional dental brush; and Fig. 6 is a left side view thereof.

1 ... bristle portion, 2, 2 ... bristles, 3 ... handle, 4 ... through-hole

Fig. 1

Fig. 2

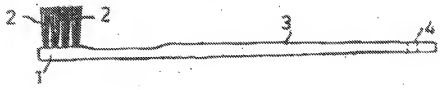


Fig. 3

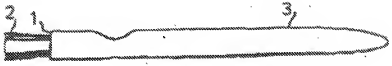


Fig. 4

Fig. 6

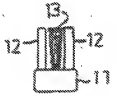
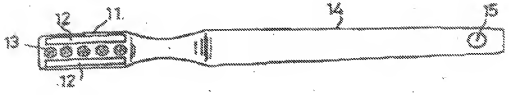


Fig. 5



⑲日本国特許庁（JP）　⑪実用新案出願公開

⑫公開実用新案公報（U）　平1-72128

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審査請求　未請求　（全2頁）

⑭考案の名称　口腔清掃用具

⑪実　願　昭62-167917
⑫出　願　昭62(1987)11月4日

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⑱実用新案登録請求の範囲

(1) 用毛にエンジニアリングエラストマーからなるフイラメントを使用したことを特徴とする口腔清掃用具。

(2) 前記口腔清掃用具が、植毛部に刷毛を植設した歯刷子であって、前記植毛部の少なくとも外側にエンジニアリングエラストマーからなる刷毛を植設したものである実用新案登録請求の範囲第1項記載の口腔清掃用具。

(3) 前記歯刷子が、植毛部の外側にエンジニアリングエラストマーからなる刷毛を植設し、植毛部の内側にナイロンフイラメントなどのエンジニアリングプラスチックからなる刷毛を植設したものである実用新案登録請求の範囲第2項記載の口腔清掃用具。

(4) 前記口腔清掃用具が、ポリッシング用具であって棒状のハンドルの先端面に、エンジニアリングエラストマーからなる刷毛のみを前記ハンドルの長手方向に沿って植毛したものである実用新案登録請求の範囲第1項記載の口腔清掃用具。

(5) 前記口腔清掃用具が、インターデンタルブラシであって用毛のすべてをエンジニアリングエラストマーからなるフイラメントで構成したものである実用新案登録請求の範囲第1項記載の口腔清掃用具。

(6) 前記エンジニアリングエラストマーが、ポリエステル系熱可塑性エラストマーである実用新案登録請求の範囲第1項～第5項のいずれか一つの項記載の口腔清掃用具。

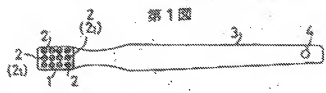
(7) 前記エンジニアリングエラストマーが、ポリスチレン系熱可塑性エラストマーである実用新案登録請求の範囲第1項～第5項のいずれか一つの項記載の口腔清掃用具。

図面の簡単な説明

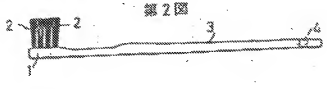
第1図は本考案を歯刷子に適用した実施例の平面図、第2図はその正面図、第3図は本考案を歯面のポリッシング用具に適用した実施例の正面図、第4図はその左側面図、第5図は従来例の歯刷子の平面図、第6図はその左側面図である。

1……植毛部、2，2₁，2₂……刷毛、3……ハンドル、4……貫通孔。

第1図



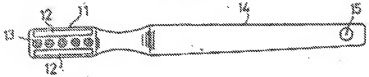
第2図



第3図

第4図

第5図



第6図